

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: MARK ROSS ET AL.

Serial No.: TO BE ASSIGNED

Group Art Unit:

Filed: CONCURRENT HEREWITH

Examiner:

Title: CLAY/ORGANIC CHEMICAL COMPOSITIONS USEFUL AS
ADDITIVES TO POLYMER, PLASTIC AND RESIN MATRICES
TO PRODUCE NANOCOMPOSITES AND NANOCOMPOSITES
CONTAINING SUCH COMPOSITIONS

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to calculation of the filing fee and prior to examination, please
amend the above-identified application as follows:

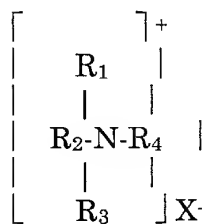
IN THE CLAIMS

Please cancel Claim 1 without prejudice or disclaimer.

Please amend Claims 2-6 as follows:

--2. (Amended) The rheological additive of Claim 17, wherein one or
more of the smectite clays is selected from the group consisting of bentonite and
hectorite.

3. (Amended) The rheological additive of Claim 17, wherein one or more of the quaternary ammonium compounds has the formula:



wherein R₁ comprises a group selected from (i) linear or branched aliphatic, aralkyl, or aromatic hydrocarbon groups having from 8 to 30 carbon atoms or (ii) alkyl or alkyl-ester groups having from 8 to 30 carbon atoms; R₂, R₃ and R₄ are independently selected from the group consisting of (a) linear or branched aliphatic, aralkyl and aromatic hydrocarbon, fluorocarbon or other halocarbon groups having from 1 to about 30 carbon atoms; (b) alkoxyated groups containing from 1 to about 80 moles of alkylene oxide; (c) amide groups; (d) oxazolidine groups, (e) allyl, vinyl, or other alkenyl or alkynyl groups possessing reactive unsaturation and (f) hydrogen; and X⁻ comprises an anion selected from the group consisting of chloride, methyl sulfate, acetate, iodide and bromide.

4. (Amended) The rheological additive of Claim 17, wherein one or more of the quaternary ammonium compounds comprises a quaternary ammonium compound that contains at least one hydrocarbon chains having from about 8 to about 30 carbon atoms and has either no hydrophilic carbon chains or has hydrophilic radicals having a total of about 9 moles of ethylene oxide or less.

5. (Amended) The rheological additive of Claim 17, 18, or 19, wherein one or more of the quaternary ammonium compounds is selected from the group consisting of 2M2HT and M2HES.

6. (Amended) The rheological additive of Claim 17, 18, or 19, wherein one or more of the non-anionic organic polymers is selected from the group consisting of polyurethanes, polyamides, polyesters, polycarbonates, polyepoxides and polyolefins.--

Please cancel Claims 7-16 without prejudice or disclaimer.

Please amend Claim 17 as follows:

--17. (Amended) A rheological additive for liquid organic systems comprising an ion-exchanged reaction product produced by the intercalation and reaction of:

(a) one or more smectite clays;

(b) one or more quaternary ammonium compounds in an amount from about 100% to about 200% of the cation exchange capacity of the smectite clay; and

(c) one or more non-anionic organic polymers.--

Original Claims 18 and 19 are reproduced here for the Examiner's convenience.

--18. (Original) The rheological additive of Claim 17 wherein the smectite clay of paragraph a) is bentonite.

19. (Original) The rheological additive of Claim 17 wherein one or more of the quaternary ammonium compounds of paragraph b) is selected from the group consisting of 2M2HT and M2HES.--

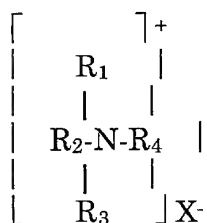
Please insert the following new claims:

--20. (New) A liquid organic system containing the rheological additive of Claim 17.

21. (New) A method of providing rheological properties to a liquid organic system comprising incorporating the additive of Claim 17 to said liquid organic system.

22. (New) The method of Claim 21, wherein the liquid organic system is selected from the group consisting of paints and coatings.

23. (New) The liquid organic system of Claim 20, wherein one or more of the quaternary ammonium compounds has the formula:



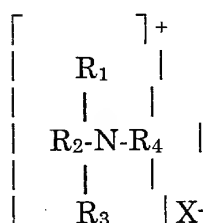
wherein R₁ comprises a group selected from (i) linear or branched aliphatic, aralkyl, or aromatic hydrocarbon groups having from 8 to 30 carbon atoms or (ii) alkyl or alkyl-ester groups having from 8 to 30 carbon atoms; R₂, R₃ and R₄ are independently selected from the group consisting of (a) linear or branched aliphatic, aralkyl and aromatic hydrocarbon, fluorocarbon or other halocarbon groups having from 1 to about 30 carbon atoms; (b) alkoxyated groups containing from 1 to about 80 moles of alkylene oxide; (c) amide groups; (d) oxazolidine groups, (e) allyl, vinyl, or other alkenyl or alkynyl groups possessing reactive unsaturation and (f) hydrogen; and X⁻ comprises an anion selected from the group consisting of chloride, methyl sulfate, acetate, iodide and bromide.

24. (New) The liquid organic system of Claim 20, wherein one or more of the quaternary ammonium compounds comprises a quaternary ammonium compound that contains at least one hydrocarbon chains having from about 8 to

about 30 carbon atoms and has either no hydrophilic carbon chains or has hydrophilic radicals having a total of about 9 moles of ethylene oxide or less.

25. (New) The rheological additive of Claim 20, wherein one or more of the quaternary ammonium compounds is selected from the group consisting of 2M2HT and M2HES.

26. (New) The method of Claim 21, wherein one or more of the quaternary ammonium compounds has the formula:



wherein R₁ comprises a group selected from (i) linear or branched aliphatic, aralkyl, or aromatic hydrocarbon groups having from 8 to 30 carbon atoms or (ii) alkyl or alkyl-ester groups having from 8 to 30 carbon atoms; R₂, R₃ and R₄ are independently selected from the group consisting of (a) linear or branched aliphatic, aralkyl and aromatic hydrocarbon, fluorocarbon or other halocarbon groups having from 1 to about 30 carbon atoms; (b) alkoxyated groups containing from 1 to about 80 moles of alkylene oxide; (c) amide groups; (d) oxazolidine groups, (e) allyl, vinyl, or other alkenyl or alkynyl groups possessing reactive unsaturation and (f) hydrogen; and X⁻ comprises an anion selected from the group consisting of chloride, methyl sulfate, acetate, iodide and bromide.

27. (New) The method of Claim 21, wherein one or more of the quaternary ammonium compounds comprises a quaternary ammonium compound that contains at least one hydrocarbon chains having from about 8 to

about 30 carbon atoms and has either no hydrophilic carbon chains or has hydrophilic radicals having a total of about 9 moles of ethylene oxide or less.

28. (New) The method of Claim 21, wherein one or more of the quaternary ammonium compounds is selected from the group consisting of 2M2HT and M2HES.

29. (New) The liquid organic system of Claim 20, wherein one or more of the smectite clays is selected from the group consisting of bentonite and hectorite.

30. (New) The method of Claim 21, wherein one or more of the smectite clays is selected from the group consisting of bentonite and hectorite.

31. (New) A liquid organic system according to Claim 20, comprising a composition selected from the group consisting of paints and coatings and said additive.

32. (New) A liquid organic system according to Claim 31, wherein said composition is an alkyd coating composition.

33. (New) A method according to Claim 21, wherein said liquid organic system comprises a coating composition.

34. (New) A method according to Claim 33, wherein said coating composition is an alkyd coating composition.

35. (New) A liquid organic system according to Claim 20, wherein one or more of the non-anionic organic polymers is selected from the group consisting of polyurethanes, polyamides, polyesters, polycarbonates, polyepoxides and polyolefins.

36. (New) A method according to Claim 21, wherein one or more of the non-anionic organic polymers is selected from the group consisting of polyurethanes, polyamides, polyesters, polycarbonates, polyepoxides and polyolefins.

REMARKS

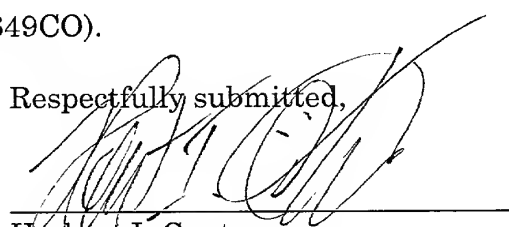
It is respectfully requested that the above amendments be entered prior to calculation of the filing fee and prior to examination. No new matter has been inserted.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #817/49649CO).

Respectfully submitted,

[Put date here]



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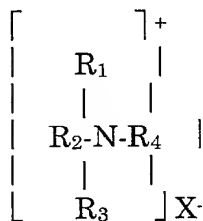
APPENDIX

IN THE CLAIMS

Please amend Claims 2-6 as follows:

--2. (Amended) The [composition] rheological additive of Claim [1] 17, wherein one or more of the smectite clays [are] is selected from the group consisting of bentonite and hectorite.

3. (Amended) The [composition] rheological additive of Claim [6 or 7] 17, wherein one or more of the quaternary ammonium compounds has the formula:



wherein R₁ comprises a group selected from (i) linear or branched aliphatic, aralkyl, or aromatic hydrocarbon groups having from 8 to 30 carbon atoms or (ii) alkyl or alkyl-ester groups having from 8 to 30 carbon atoms; R₂, R₃ and R₄ are independently selected from the group consisting of (a) linear or branched aliphatic, aralkyl and aromatic hydrocarbon, fluorocarbon or other halocarbon groups having from 1 to about 30 carbon atoms; (b) alkoxyated groups containing from 1 to about 80 moles of alkylene oxide; (c) amide groups; (d) oxazolidine groups, (e) allyl, vinyl, or other alkenyl or alkynyl groups possessing reactive unsaturation and (f) hydrogen; and X⁻ comprises an anion selected from the group consisting of chloride, methyl sulfate, acetate, iodide and bromide.

4. (Amended) The [composition] rheological additive of Claim [6 or 7] 17, wherein one or more of the quaternary ammonium compounds comprises a quaternary ammonium compound that contains at least one hydrocarbon chains having from about 8 to about 30 carbon atoms and has either no hydrophilic carbon chains or has hydrophilic radicals having a total of about 9 moles of ethylene oxide or less.

5. (Amended) The [composition] rheological additive of Claim [6 or 7] 17, 18, or 19, wherein one or more of the quaternary ammonium compounds is selected from the group consisting of 2M2HT and M2HES.

6. (Amended) The [composition] rheological additive of Claim [1] 17, 18, or 19, wherein one or more of the non-anionic organic polymers [are] is selected from the group consisting of polyurethanes, polyamides, polyesters, polycarbonates, polyepoxides and polyolefins.--

Please cancel Claims 7-16 without prejudice or disclaimer.

Please amend Claim 17 as follows:

--17. (Amended) A rheological additive for liquid organic systems comprising an ion-exchanged reaction product produced by the intercalation and reaction of:

(a) one or more smectite clays;

(b) one or more quaternary ammonium compounds in an amount from about 100% to about 200% of the cation exchange capacity of the smectite clay;
and

(c) one or more non-anionic organic [materials] polymers.--